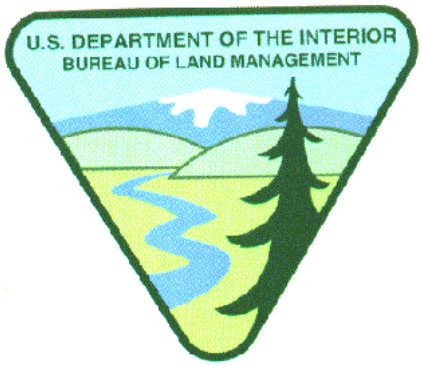
2001 Lemhi River Watershed TMDL Implementation Report and 2002 TMDL Implementation Plan



Salmon Field Office
Bureau of Land Management

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2001 Lemhi River Watershed TMDL Implementation Report and 2002 Implementation Plan

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Overview

Section 303(d) of the Clean Water Act requires that states systematically evaluate water quality and every two years list waters that do not meet water quality goals relating to the support of beneficial uses. More focused water quality evaluations are required for streams that do not support their beneficial uses in order to estimate the maximum amount of a given pollutant that a body of water can assimilate without violating water quality standards. This process is referred to as estimating the "total maximum daily load" (TMDL) for a pollutant of a specific water body.

In 1999, the Idaho Department of Environmental Quality (IDEQ) published the Lemhi River Watershed TMDL. The TMDL was developed to address water quality concerns on the Lemhi River and seven tributary streams in the Lemhi subbasin. These surface waters within the subbasin were identified as having a beneficial support status less than Full Support.

Table 1. 1999 TMDL list of water quality impaired stream reaches for the Lemhi River Watershed.

Stream	Listed Reach	Pollutant
Bohannon	BLM/private boundary - Lemhi River confluence	sediment
Eighteenmile	headwaters - Lemhi River confluence	sediment
Geertson	BLM/private boundary - Lemhi River confluence	sediment
Kirtley	North Fork/East Fork confluence - Lemhi River confluence	sediment
McDevitt	BLM/private boundary - Lemhi River confluence	sediment
Sandy	BLM/private boundary - Lemhi River confluence	sediment
Wimpey	BLM/private boundary - Lemhi River confluence	sediment
Lemhi River	headwaters to confluence with the Salmon River	fecal coliform bacteria

Of the seven tributaries identified as having a beneficial support status of less than Full Support, water quality concerns on six of the streams require the attention of BLM management. Of these, Eighteenmile Creek is the only stream with major portions of BLM land in the listed reach. Listed reaches of Bohannon and Wimpey Creeks include corners of BLM land. McDevitt, Kirtley, and Geertson Creeks were determined to fully support beneficial uses from the headwaters to the BLM/private boundary, but several factors on public land were identified

as impacting the lower reaches. McDevitt Creek has the largest reach on BLM identified as needing improvement, approximately 6.5 miles. The TMDL identified no factors affecting water quality on Sandy Creek from BLM managed lands; therefore, information regarding Sandy Creek is not included in this document.

In addition to the seven Lemhi tributaries listed in the TMDL, Hawley and Mill Creeks also had reaches identified as unable to meet State water quality standards due to dewatering for irrigation. IDEQ determined that the Hawley Creek reach from the second diversion to the Lemhi cannot support beneficial uses because of current irrigation practices. IDEQ also determined that the Mill Creek reach from the FS/BLM boundary to the Lemhi cannot support beneficial uses because of current irrigation practices. These streams were not included in the TMDL and therefore will not be included in this document.

In 1998, IDEQ published a new 303(d) list for water quality impaired streams in the Lemhi subbasin. This list, provided in Table 2, identified temperature as a pollutant in eight tributaries and sediment as a pollutant in two additional tributaries. None of these water quality concerns were addressed in the 1999 TMDL; however, the BLM is taking action to monitor temperature on the listed streams. When applicable, water temperature data from these monitoring efforts are included in this report. Results from all water temperature monitoring efforts are available in the Annual Water Temperature Monitoring Report.

Table 2. 1998 303(d) list for the Lemhi River Watershed, additional reaches and pollutants.

Stream	Listed Reach	Pollutant
Bohannon	headwaters - Lemhi	temperature
Eighteenmile	headwaters - Lemhi	temperature
Kenney	headwaters - Lemhi	temperature
Little Eightmile	headwaters - Lemhi	temperature
Kirtley	headwaters - Lemhi	temperature
Sandy	headwaters - Lemhi	temperature
Wimpey	headwaters - Lemhi	temperature
Short (Hayden trib)	headwaters - Bear Valley Cr	sediment
Cruikshank	headwaters - Canyon Cr	sediment

The BLM is responsible for the administration, management, and protection of nearly one-half million acres of public land in the Salmon Field Office. The agency has authority to regulate, license, and enforce land use activities that affect nonpoint source pollution control from the Taylor Grazing Act, the Clean Water Act, the Federal Land Policy and Management Act, the

Public Rangelands Improvement Act, the National Environmental Policy Act, the Emergency Wetlands Resource Act, the Agricultural Credit Act, the Land and Water Conservation Fund Act, and the Executive Orders for Floodplain Management and Protection of Wetlands.

As a Designated Management Agency (DMA), it is the BLM's responsibility to design activities and implement Best Management Practices (BMP's) to ensure that State water quality standards are met. Following the completion of the Lemhi River Subbasin Assessment in March 1999 and the Lemhi River Watershed TMDL in December 1999, the Salmon Field Office drafted a TMDL implementation plan and submitted it to IDEQ in January 2001. This document follows the January 2001 implementation plan and serves to report on the work completed in 2000 and 2001 and identify data needs and projects for implementation in 2002.

Points of Contact

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Figure 1. Idaho Subbasins

Riparian Management History

The overall goal of the Salmon Field Office is to protect and enhance natural resources and manage uses so they are compatible with sustaining the functionality of the ecosystem. The Field Office utilizes an interdisciplinary team approach with on-the-ground knowledge for all aspects of management. Over the past decade, the Salmon Field Office has focused land management efforts on improving riparian health. The listing of chinook as an endangered species in 1991 served as a catalyst to increase these efforts; however, our vision is to obtain ecosystem health for the benefit of all species.

The Salmon Field Office has employed many different methods to allow for the recovery of riparian areas. These include changing grazing schedules to take into consideration both the length of time and time of year grazing occurs in riparian areas, excluding certain sections of stream channels and springs from livestock use, building water developments to improve distribution, and, when necessary, reducing the number animal use months (AUMs) in an allotment. The success of these efforts are evaluated in the end of year monitoring of riparian key areas. Monitoring methods include greenline transects, stubble heights, riparian shrub use, riparian condition, and photographs. Results from the end of year monitoring are summarized each year in an annual monitoring report. Overall, riparian key areas throughout the Field Office are showing clear improvement.

For the past three fiscal years, the Salmon Field Office has successfully competed for Clean Water Watershed Restoration funds from the BLM Washington Office. In 1999, a total of $44,000 was received to support water quality improvement efforts. In 2000, a total of $247,700 was received to fund projects reducing sediment production and improve riparian habitat in the Kenney, Geertson, Kirtley, Kriley, Carmen, Wimpey, Bohannon, Dummy, Badger, Hot Springs, and Eighteenmile Creek drainages. Use of these funds included TMDL implementation on 303(d) listed streams. In 2001, a total of $288,000 was received to fund projects reducing sediment production and improve riparian habitat in the Hawley, Cow, McDevitt, and Kenney Creek drainages. In addition, these funds were obtained for water quality monitoring on Geertson, Bohannon, Kirtley, and Wimpey Creeks.

In August 2001, an amendment to the Lemhi Resource Management Plan (RMP) was approved. The amendment makes significant changes in the BLM's management of off highway vehicle (OHV) use that will have a positive effect on water quality. Previous to the 2001 amendment, more than 90% of all land managed by the Salmon Field Office was designated open to unrestricted OHV use with the remainder designated limited use or closed. The amendment removed all lands from open designation with 96.5% designated limited use and 3.5% closed to vehicle use. With the implementation of the RMP amendment, OHV use in all TMDL listed drainages will be either limited or closed, reducing sediment production into stream channels from roads and trails.

Lemhi Subbasin Monitoring Efforts Summary 2000 - 2001

Fish Surveys

In coordination with the Idaho Department of Fish and Game, fish population estimates and presence/absence surveys were conducted on a number of Lemhi tributaries in order to provide current information on the condition of streams and their ability to support designated beneficial uses. Section 303(d) listed streams and tributaries sampled in 2000 were: Eighteenmile Creek, Bohannon Creek, East Fork Bohannon Creek, East Fork Kirtley Creek, Geertson Creek, and East Fork and West Fork Wimpey Creek. Fifteen Lemhi tributaries were sampled in 2001. Of these, North Fork Kirtley and Sandy Creeks were the only streams on the 303(d) lists. Fish surveys will continue in 2002.

Bank Stability

Bank stability ratings were completed on 303(d) sediment listed streams in order to evaluate current conditions and identify potential sources of sediment. In 2000, bank stability was evaluated on Eighteenmile Creek in the WSA in order to quantify existing stability ratings and determine how they compare to the desired 80% stable "natural" levels identified in the TMDL. In 2001, stability ratings were completed on all but one reach identified in the TMDL as requiring reductions in bank erosion rates. Stream evaluated were Bohannon, Eighteenmile, McDevitt, and Wimpey Creeks. The BLM will continue bank stability surveys in 2002.

Core Sampling

No McNeal core samples were taken on the BLM portion of listed reaches at BURP sites sampled during the assessment process due to other priorities. The purpose of these surveys would be to provide current information on the condition of listed streams and their ability to support designated beneficial uses. The BLM plans on taking core samples in 2002.

Road Inventory

Beginning in 2000, the BLM began the process of conducting detailed road inventories in coordination with the USFS and Lemhi County. Part of this inventory includes the identification of existing and potential sediment sources and drainage limitations. The information gathered will be used to verify the effects of roads identified in the TMDL as sediment producers and help guide future restoration efforts with the goal of improving water quality. By the end of the 2001 field season, road inventories conducted by the BLM were complete in the Eighteenmile, Agency, Kenney, and Pattee drainages and started in the Geertson, Kirtley, Carmen, Badger, Tower, and Kriley drainages. The BLM will continue detailed inventories of roads in coordination with the USFS and Lemhi county.

Water Temperature Monitoring

As part of BLM's ongoing effort to monitor riparian habitat, temperature data is collected each season on streams throughout the Lemhi subbasin. Although not directly related to this TMDL, this information will be useful in the next Lemhi River TMDL with the recent placement of several streams on the final 1998 list (Table 2) for not meeting temperature standards.

In 2000, the BLM monitored temperatures on three out of the eight streams listed for temperature: Eighteenmile, Kenney, and Wimpey Creeks. The protective cases for both Kenney Creek thermographs failed in 2000, resulting in the loss of data for this stream. Temperatures for both Eighteenmile and Wimpey Creeks exceeded State standards during several days in 2000, but not for extensive periods.

In 2001, the BLM monitored temperature on five of the eight listed streams: Eighteenmile, Kenney, Kirtley, Wimpey, and Frank Hall (Cruikshank tributary) Creeks. Thermographs failed at the lower Kenney Creek, East Fork Kirtley Creek, Wimpey Creek, and West Fork Wimpey Creek locations resulting in the loss of data for those streams. Where data were successfully collected, temperatures met State standards at the upper Kenney, North Fork Kirtley, and Frank Hall sites. Temperatures exceeded State standards at both of the Eighteenmile Creek sites. The BLM plans on continuing water temperature collection throughout the Lemhi subbasin.

Noxious Weed Inventory

The BLM Salmon Field Office participates in an interagency effort to inventory and treat noxious weeds in the Lemhi and Salmon River drainages. The purpose of weed control is to preserve and protect the ecological functions of watersheds including water quality. Noxious weeds of concern include rush skeleton weed, leafy spurge, white top, spotted knapweed, and Russian knapweed. In 1996, the BLM began a systematic effort to inventory the extent of spotted knapweed and leafy spurge infestations. With this information, the BLM strategy is to use chemical and mechanical means to control and eliminate weeds where they are invading clean areas and where weed densities are still relatively sparse and to use biological control agents in heavily infested areas.

Spotted knapweed inventory efforts have been focused on road corridors. Leafy spurge inventory efforts have been focused in areas surrounding the Carmen Creek infestation and along the Salmon River corridor. The road inventory of spotted knapweed is complete from the Peterson Creek to Kirtley Creek drainages and between McDevitt and Haynes Creeks. Inventory of leafy spurge is almost complete in the Kirtley Creek and Diamond Moose drainages. The leafy spurge inventory will be completed in the Kirtley Creek drainage in 2002 and will continue in other areas surrounding Carmen Creek. The BLM also completed a helicopter survey of leafy spurge in the Birch Creek watershed. The BLM plans on continuing and expanding its efforts at weed inventory and control in the future.

Lemhi Subbasin Project Impelmentation Summary 2000 - 2001

In 2000 and 2001, the Salmon Field Office completed a variety of projects in TMDL listed drainages with the goal of improving drainage off roads, reducing sediment production, and improving overall water quality. Road maintenance projects included surfacing, drainage improvements, and cattleguard installation and maintenance. Livestock management projects included fence building and maintenance and water developments. Chemical, mechanical, and biological weed treatment continued throughout the subbasin. Detailed information about projects completed are listed by specific drainage later in this report.

TMDL Implementation and 2002 Implementation Plan

The following portion of this document describes the issues, concerns, and sediment reduction requirements identified in the TMDL for individual tributaries and outlines the results of the BLM's data gathering efforts and project implementation during 2000 and 2001 field seasons. Any remaining data gathering or project needs are identified for implementation in the 2002 field season.

The Lemhi River TMDL identified three stream reaches encompassing BLM-managed lands as not meeting State water quality standards: Bohannon, Eighteenmile, and Wimpey Creeks. Of these, BLM manages significant portions of the listed reach only on Eighteenmile Creek. BLM managed lands were identified as impacting water quality on the portions of McDevitt, Geertson and Kirtley Creeks downstream of public lands.

BLM data gathering efforts to address TMDL water quality concerns included conducting fish presence/absence studies, surveying bank stability, and evaluating road conditions. Since the streams considered in the Lemhi River Subbasin TMDL are on the 303(d) list for sediment pollution, bank stability surveys by the BLM were the primary means of verifying the water quality concerns identified in the TMDL. As written in the TMDL, IDEQ assumes that streams will have 80% or higher stable banks under natural conditions. Following Idaho BLM protocols for assessing bank condition, the Salmon Field Office used this standard to assess whether or not bank stability goals are being met on BLM managed sections of the TMDL listed streams.

Bohannon Creek

Water Quality Concerns

IDEQ data shows subsurface fine sediments <1/4" at 30% on Bohannon Creek which is above desired levels of <25%. BLM lands cross two reaches identified as having problems. Three roads on BLM have been identified as sources of sediment, the West Fork Wimpey Creek Road, and the four-wheel drive trails up the East Fork and main Bohannon Creeks.

Data Gathering Results

Fish Surveys

The Idaho Department of Fish and Game (IDFG) electroshocked the mainstem and East Fork of Bohannon Creek in the summer of 2000. On mainstem Bohannon, 39 fish of multiple year classes and several species were captured in three reaches. On the East Fork of Bohannon, six fish of multiple year classes and two species were captured in three reaches.

Streambank Stability

In 2001, the BLM surveyed bank stability on the sections of the East Fork and Lower Bohannon Reaches crossing BLM land. Results are listed in Table 3 and shown in Figure 2.

Table 3. Bohannon Creek bank erosion required reductions on BLM and bank stability survey results.

Site	Required Reduction in Erosion Rates	BLM Surveyed Percentage Stable Bank
E. Fork Reach	58%	80%
Lower Reach	88%	76%

The TMDL called for a 58% reduction in bank erosion rates on the East Fork Reach. The BLM's survey found 80% stable banks in this reach; therefore, BLM lands along the East Fork are at naturally stable conditions. Overall, this reach is characterized by a mature overstory of cottonwoods, alders, and aspen with younger willow, aspen, and alder shoots. Much of this reach is located in a deep canyon created by downcutting related to historic mining and is inaccessible to cattle. Bank erosion in this canyon has been accelerated in the past with runoff from flood irrigation on private lands above; however, the source of this runoff has been eliminated with the landowner's change to a sprinkler system. Areas accessible to cattle show some evidence of bank trampling with a vegetative cover of mainly of upland species. The uppermost section is a large gravel bar complex. BLM lands along the listed East Fork Reach are currently fenced in with private land.

The TMDL called for a 88% reduction in bank erosion rates along the lower reach. BLM's survey found 76% stable banks on BLM land in this reach, indicating banks are slightly less stable than estimated natural conditions. Most of the unstable banks managed by BLM in this reach are located in a water gap for the McMurdie pasture, Wimpey Coal Mine Allotment. This reach has an overstory of mature cottonwoods and other riparian trees.

Completed Project Implementation

In 2000, maintenance work on the West Fork Wimpey Creek Road included cleaning cattleguards, surfacing approximately 1/4 mile with gravel, and installing a culvert for sediment reduction and improved drainage. In addition, discussions were initiated with the private land owner for a prescribed burn to improve the water balance on the forest/sagebrush edge.

During the 2001 season, improvements were made on the East Fork Bohannon Road/Trail. Waterbars and ditches were maintained on approximately ½ mile of road to improve drainage and reduce the distance that water flows down the road. This will improve the road condition but have no impact on water quality because drainage off the road does not reach the stream. The headwaters of the East Fork of Bohannon Creek are not impacted by this road, nor is any other portion of the stream, due to the distance of the road from the stream and the cobble-sized rocks on the road surface.

2002 Implementation Plan

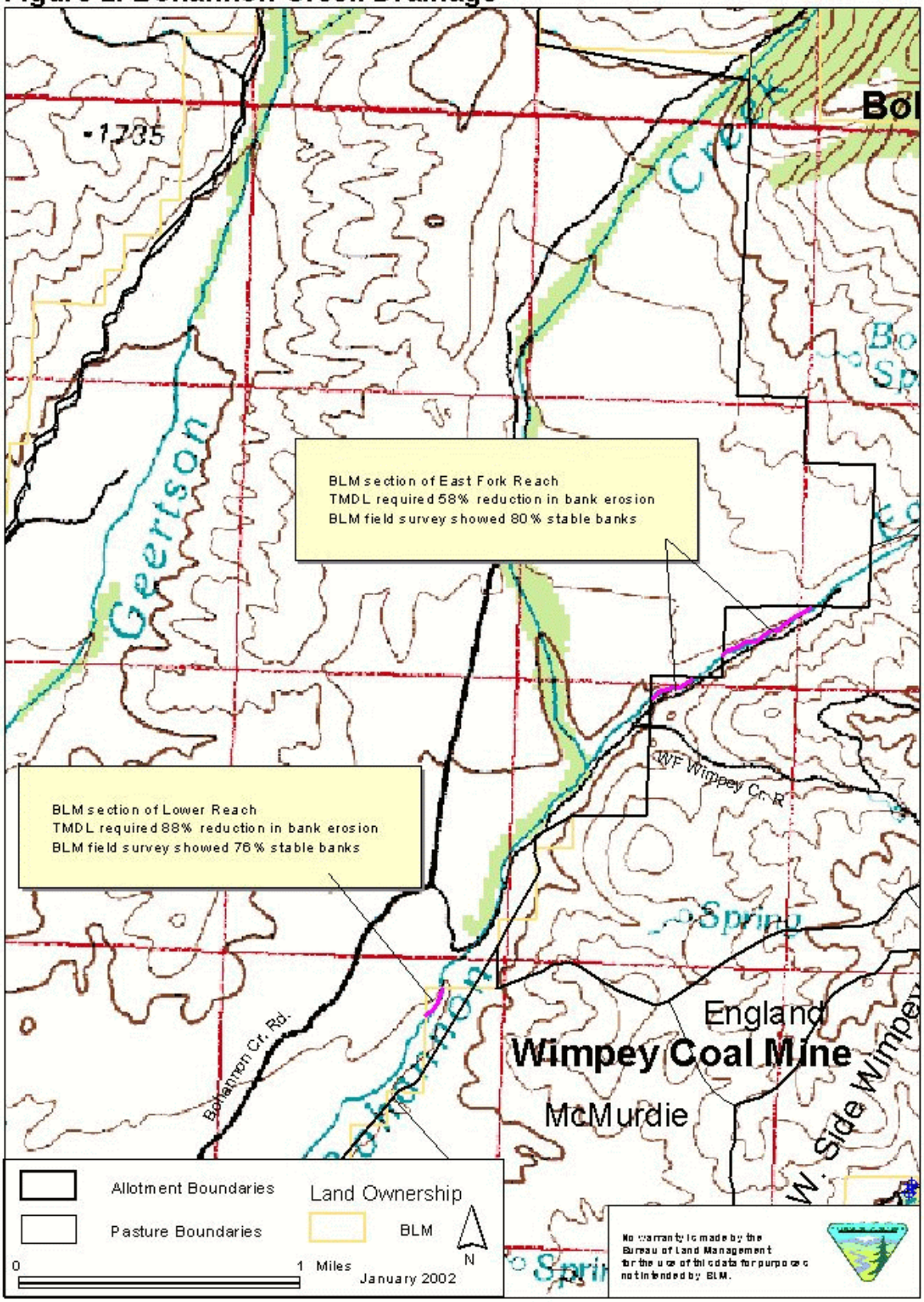
Remaining Data Needs

The BLM will continue monitoring water temperature monitoring on Bohannon Creek. In addition, sediment production from the West Fork Wimpey Creek Road, East Fork Road/Trail, and the Bohannon Road/Trail may be modeled and evaluated; however, discussion with USFS research station employees in 2001 showed that given the soil type and road surface, limited information would be attained through modeling. The BLM will consider the benefits of conducting this modeling in the future. The BLM will evaluate ways to improve bank stability on the Lower Reach, especially in areas impacted by the watergap. Finally, McNeal core samples will be taken following Salmon Challis National Forest protocols at the BURP monitoring site located 200 meters below the West Fork Wimpey Creek Road (NE1/4, NE1/4, Sec 22).

Remaining Project Implementation

An exclosure fence is planned at the BLM/private boundary on the mainstem of Bohannon Creek to keep cattle off of an impacted section of stream and allow for improved bank stability. Work will continue as necessary to improve drainage off roads and trails, implementing Best Management Practices, and control weeds in the drainage.

Figure 2. Bohannon Creek Drainage



Eighteenmile Creek

Water Quality Concerns

IDEQ data shows subsurface fine sediments <1/4" at 30% on Eighteenmile Creek which are above desired levels of <25%. BLM lands cross one of two reaches identified in the erosion inventory as producing excess amounts of sediment.

Figure 3. Eighteenmile Creek looking upstream near the Wilderness Study Area/private boundary. July 14, 1999.

Figure 4. Eighteenmile Creek key area in the WSA. October 3, 2001.

Data Gathering Results

Road Inventory

An inventory of roads in the Eighteenmile watershed was completed during the 2000 field season. This inventory assessed the condition of the roads and identified priorities for implementing BMPs.

Streambank Stability

In 2000, the BLM surveyed bank stability in the Eighteenmile Wilderness Study Area (WSA) for comparison to near natural conditions. Four reaches totaling 0.4 miles were inventoried. Bank stability ratings ranged from a low of 68% stable to a high of 88% stable with an overall rating of 85% stable. The evaluated reaches included several previously occupied beaver complexes which have lost all their dams. This loss of structure has resulted in a relatively unstable system at risk for further reductions in stability, but still above the 80% "natural" levels proposed in the TMDL.

In 2001, the BLM surveyed bank stability on BLM lands within the TMDL's Eighteenmile Creek Lower Reach located in Eighteenmile Flat pasture exclosure, Powderhorn Allotment and the A pasture watergap, Center Ridge Allotment. Results are listed in Table 4 and shown in Figure 5.

Table 4. Eighteenmile Creek bank erosion required reductions on BLM and bank stability survey results.

Site	Required Reduction in Erosion Rates	BLM Surveyed Percentage Stable Bank
Eighteenmile Creek Lower Reach	77%	80%

The TMDL called for a 77% reduction in bank erosion rates on the Lower Reach (Figure 5). The BLM's survey found 80% stable banks; therefore, BLM lands along the Lower Eighteenmile Reach are at naturally stable conditions. This reach has a low gradient Rosgen "E" channel type with a heavy silt substrate and is in an active beaver complex. Most unstable banks are bar complexes resulting from beaver activities. Heavy sediment levels are also the result of beaver activities. Riparian vegetation along this reach is primarily willow, *Carex, Catabrosia*, or early successional plants. There is some evidence of bank trampling and hummocking due to cattle.

Water Temperature Monitoring

The BLM has monitored water temperature with thermographs on Eighteenmile Creek since 1994 as part of an ongoing effort to monitor riparian health on BLM managed lands. Thermograph locations are shown in Figures 5 and 6. In 2001, water temperature data were collected at the upper and lower Eighteenmile Creek thermograph sites. The thermographs were in place from late June until the middle of October and were set to record ten temperature readings per day. Water temperature profiles are shown in Figures 7 - 10. Temperatures stayed below PACFISH standards at the upper monitoring site. Temperatures exceed PACFISH standards at the lower monitoring site. The high temperatures at the lower site can be attributed to a lack of riparian vegetation upstream on State and private parcels and the influence of the extensive beaver complexes.

Figure 5. Lower Eighteenmile Creek Drainage

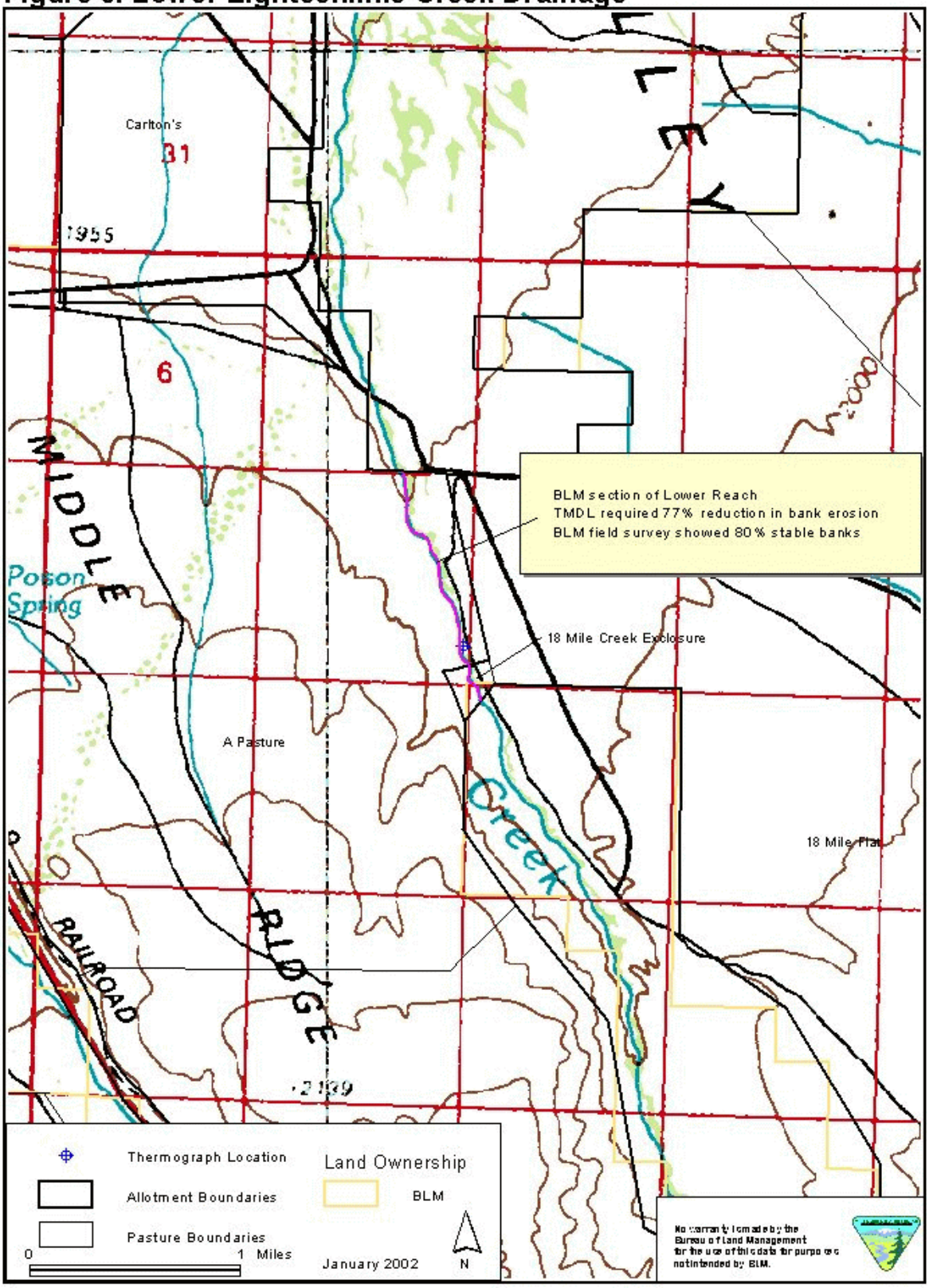


Figure 6. Upper Eighteenmile Drainage

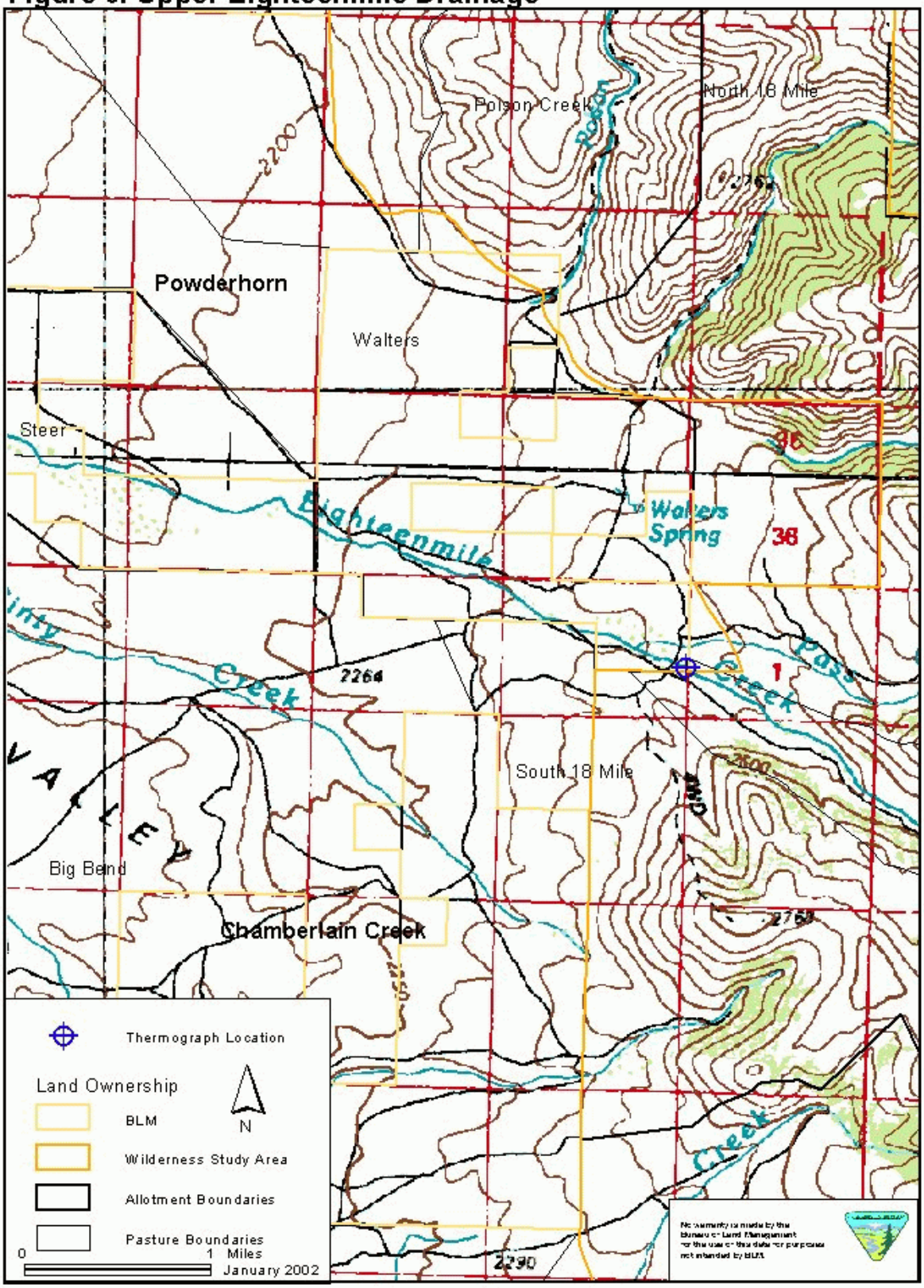


Figure 7. Eighteenmile Creek - Lower Thermograph Monitoring Site

Summer 2001 Water Temperature Profile 1

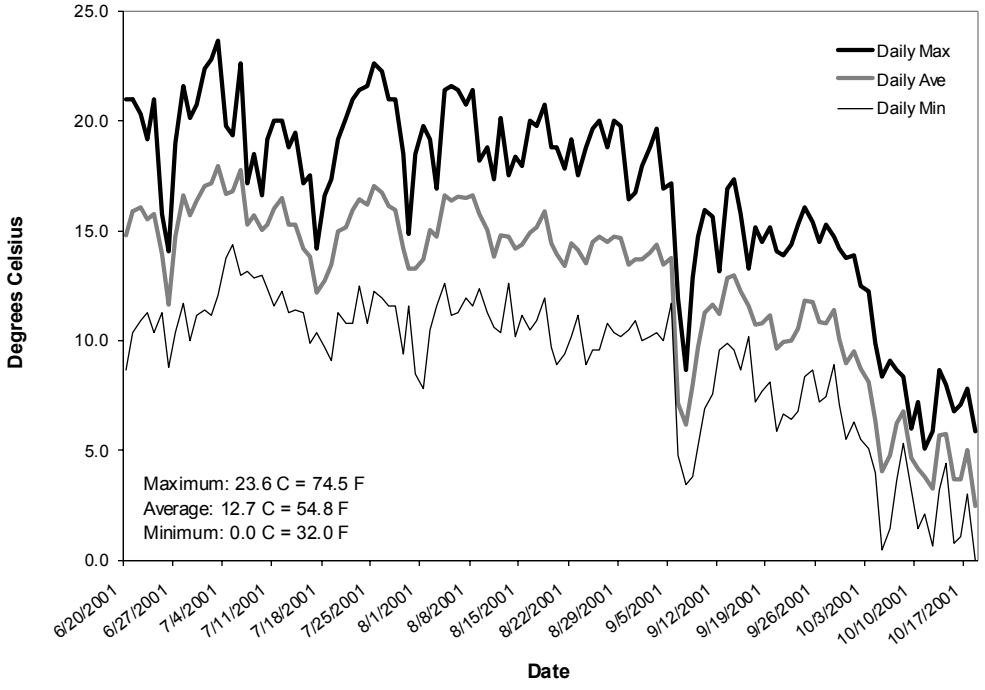


Figure 8. Eighteenmile Creek - Lower Thermograph Monitoring Site

Summer 2001 Water Temperature Profile 2

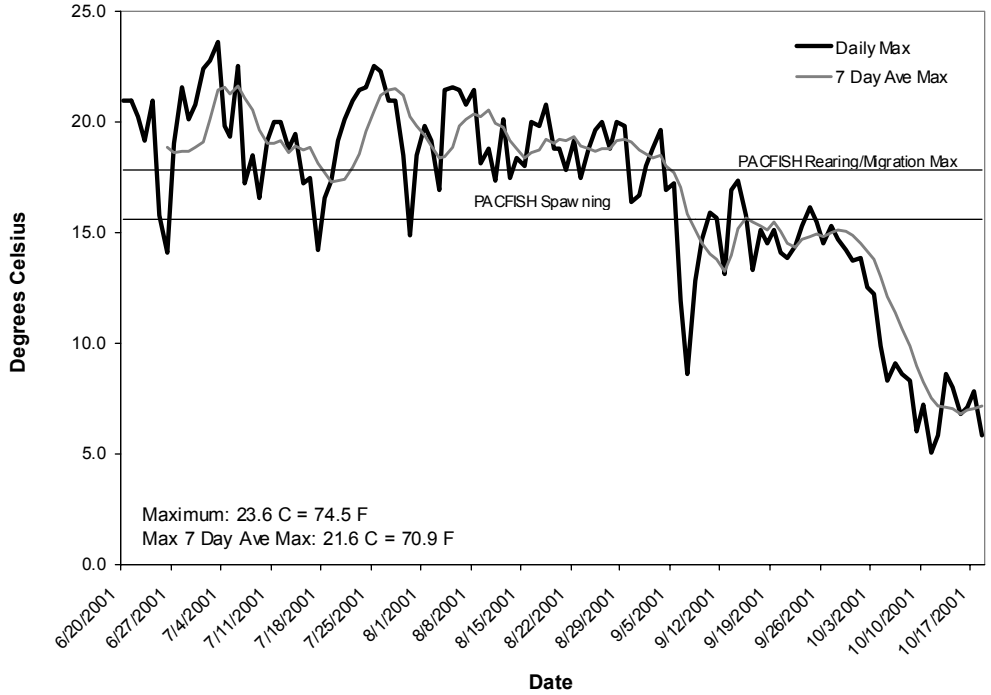


Figure 9. Eighteenmile Creek Upper Thermograph Monitoring Site

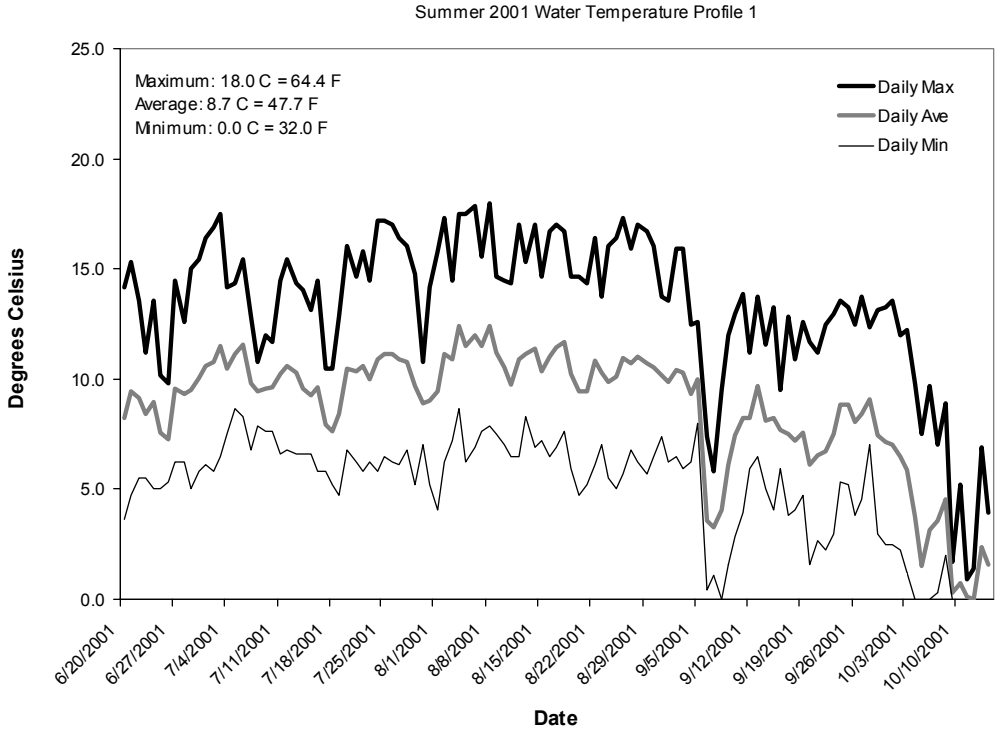
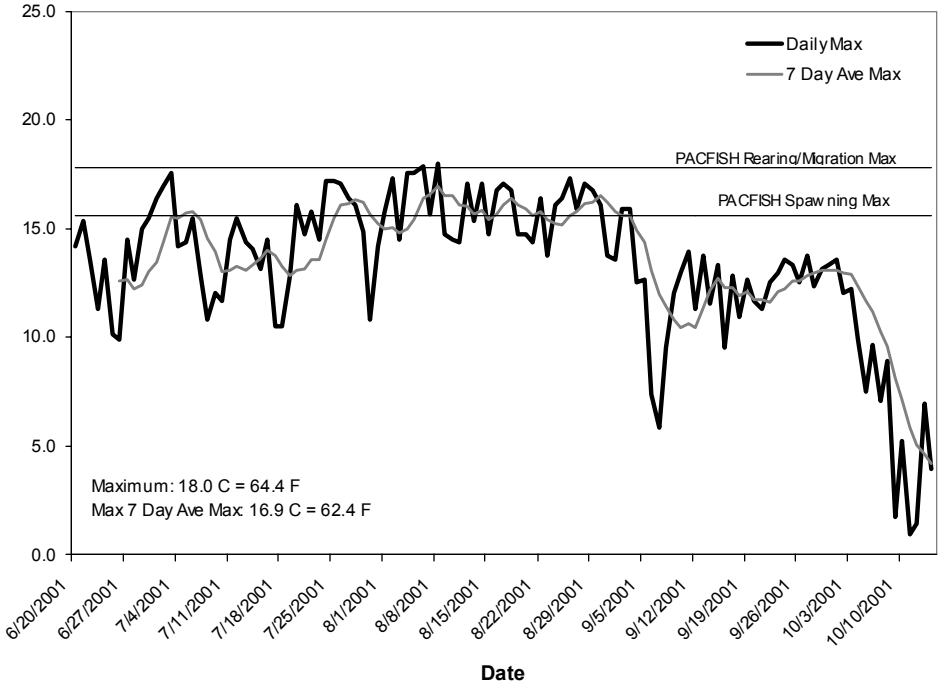


Figure 10. Eighteenmile Creek - Upper Thermograph Monitoring Site



Completed Project Implementation

A number of projects to reduce the potential for sediment production were completed during 2000 and 2001. In 2000, 12 miles of road were bladed (Tenmile Creek Road, McFarland Boulevard, Divide Creek) including reconstructing the road prism, improving drainage, and cleaning ditches. This will allow for proper water flow and reduced sediment delivery to Eighteenmile Creek. Reconstruction on the Eighteenmile Creek Road was initiated for the same reasons. Two livestock grazing exclosures on Eighteenmile Creek were maintained to continue riparian area improvement, and a culvert on Clear Creek was installed to prevent further erosion of the road surface.

In 2001, two of three exclosures along Eighteenmile creek were again maintained. In addition, a section of fence around the Eighteenmile exclosure located at the corners of sections 8, 9, 16, and 17 was replaced and extended to include part of the Pasture A watergap (Figure 11). The TMDL identified water crossing of pioneered two-tracks in the watershed as a significant contributor of sediment into Eighteenmile Creek. Using the information gathered in the 2000 road inventory, road improvement projects were completed in order to improve the condition of major roads and reduce the amount of traffic on pioneered two-tracks. Road maintenance completed during 2001 include the addition of two culverts and some gravel surfacing on the Clear Creek Road (Figure 12), the replacement of four cattleguards on the Eighteenmile Creek Road, and surfacing of two miles on McFarland Boulevard over areas of bentonite clay (Figure13).

Figure 11. New section of fence for the Eighteenmile Creek exclosure. October 19, 2001.

Figure 12. New culvert on the Eighteenmile Creek Road. September 2001.

Figure 13. Gravel surfacing over areas of bentonite clays on McFarland Boulevard. November 2001.

Figure 14. Improving drainage on McFarland Boulevard. November 2001.

2002 Implementation Plan

Remaining Data Needs

Water temperature data collection will continue on Eighteenmile Creek. McNeal core samples will be taken following Salmon Challis National Forest protocols at the BURP site at T14N, R27E, SW1/4, SW1/4, NW 1/4, Sec36.

Remaining Project Implementation

Road improvements will continue in the Eighteenmile drainage to bring all main routes up to Best Management Practices, reduce sediment production, and discourage use of pioneered two-tracks.

Implementation of New Travel Restrictions

In August 2001, the Salmon Field Office, BLM approved an amendment to the Lemhi Resource Management Plan creating new travel restrictions. In the Eighteenmile Creek watershed, these new restrictions limit motorized travel to existing roads, vehicle ways, and trails and close the entire WSA to motorized vehicles. With the implementation of these new travel restrictions, sediment production and erosion from OHV use should diminish.

Geertson Creek

Water Quality Concerns

IDEQ data shows subsurface fine sediments at 27.8% on Geertson Creek which are above desired levels of <20%. An assumption was made that conditions on Gary Creek were the same as the Upper (private) Reach on Geertson Creek since they were both listed as Functional At Risk. Therefore, Gary Creek was identified as requiring the same reduction in erosion. No data was gathered by IDEQ to support this assumption.

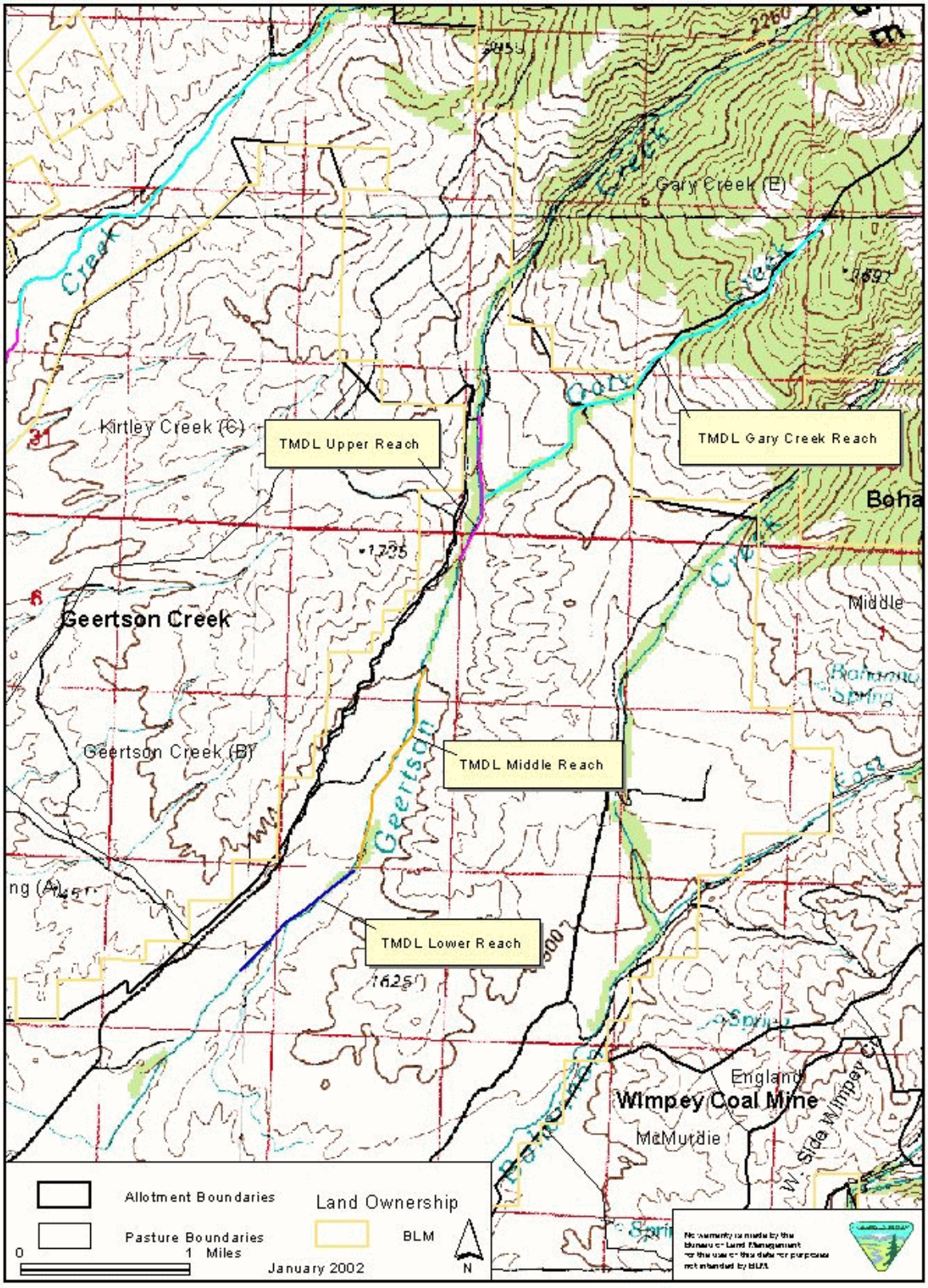
Table 5. Geertson Creek bank erosion required reductions on BLM.

Site	Required Reduction in Erosion Rates	BLM Surveyed Percentage Stable Bank
Gary Creek Reach	95%	to be completed 2002

Figure 15. Geertson Creek looking upstream near the BLM/private boundary. July 26, 2000.

Figure 16. Geertson Creek looking downstream part way up the canyon on BLM. July 26, 2000.

Figure 17. Geertson Creek Drainage



Data Gathering Results

Fish Surveys

In 2000, the BLM electroshocked Geertson Creek to confirm the presence/absence of multiple age classes of fish on BLM land. Thirty-two fish of multiple age classes including YOY were captured in two reaches with bull trout the dominant species captured.

Completed Project Implementation

In 2000, materials were purchased for an exclosure fence on main Geertson Creek. In addition, a discussion was initiated with permittees about discontinuing livestock grazing on the upper portions of Geertson Creek and changing the overall grazing plan for the Geertson Creek drainage.

During 2001, upper sections of the Geertson Creek Road were evaluated for sediment production potential, and work was done to direct spring water off the road and into the stream channel. Waterbars were dug to improve drainage along a section of the Geertson Creek Road below the intersection to the Ranger mine.

2002 Implementation Plan

Remaining Data Needs

Bank stability and proper functioning condition (PFC) needs to be evaluated on the Gary Creek Reach listed in the TMDL. The BLM will also determine whether or not fish spawn near the Geertson Lake outlet. In addition, sediment production potential from roads may be modeled if deemed beneficial; however, current observations and professional judgement indicate that limited erosion occurs.

Remaining Project Implementation

Drainage structures on the upper section of the Geertson Creek Road will need annual maintenance. Existing drainage structures can be repaired or replaced by hand with native materials to continue drainage improvement. The section of the Geertson Creek Road above the intersection to the Ranger mine is effectively captured by Geertson Creek; however, channel substrate in this section is mainly large cobbles and contributes minimal amounts of sediment into the stream. Efforts to relocate the stream channel or road would be ineffective and not result in a significant reduction in sediment potential. Weed control will continue in this drainage as needed. Materials purchased in 2000 will be used to build an exclosure fence on Geertson Creek in section 27, and the Gary Creek pipeline will be extended to provide an alternative water source for livestock.

Kirtley Creek

Water Quality Concerns

IDEQ data shows subsurface fine sediments at 33.3% on Kirtley Creek which are above the desired levels of <20%. The TMDL identified placer mining in the lower valley bottom on private land as constraining the stream channel and affecting streambank stability downstream. The main Kirtley Creek Road and four wheel drive trails in the North and East Fork drainages were identified as sediment sources based on erosive soil types and their proximity to the stream channel.

Table 6. Kirtley Creek bank erosion reductions.

Site	Required Reduction in Erosion Rates	BLM Surveyed Percentage Stable Bank
Upper	95%	n/a
Lower	95%	n/a

Data Gathering Results

Streambank Stability

No survey was conducted for bank stability on BLM managed sections of Kirtley Creek because both the Upper and Lower Reaches identified in the TMDL as requiring a reduction in bank erosion rates are on private land (Figure 18).

Water Temperature Monitoring

The BLM has monitored water temperature with thermographs on Kirtley Creek since 1998 as part of an ongoing effort to monitor riparian health on BLM managed lands. In 2001, the collection of water temperature data was attempted on both the North and East Forks just above their confluence (Figure 18). The thermographs were in place from late June until the middle of October and were set to record ten temperature readings per day. Unfortunately, the thermograph failed at the East Fork monitoring site and data were only successfully collected for the North Fork. Water temperature profiles for the North Fork of Kirtley Creek are shown in Figures 19 and 20. As shown in Figure 20, water temperatures stayed well below PACFISH standards.

Figure 18. Kirtley Creek Drainage

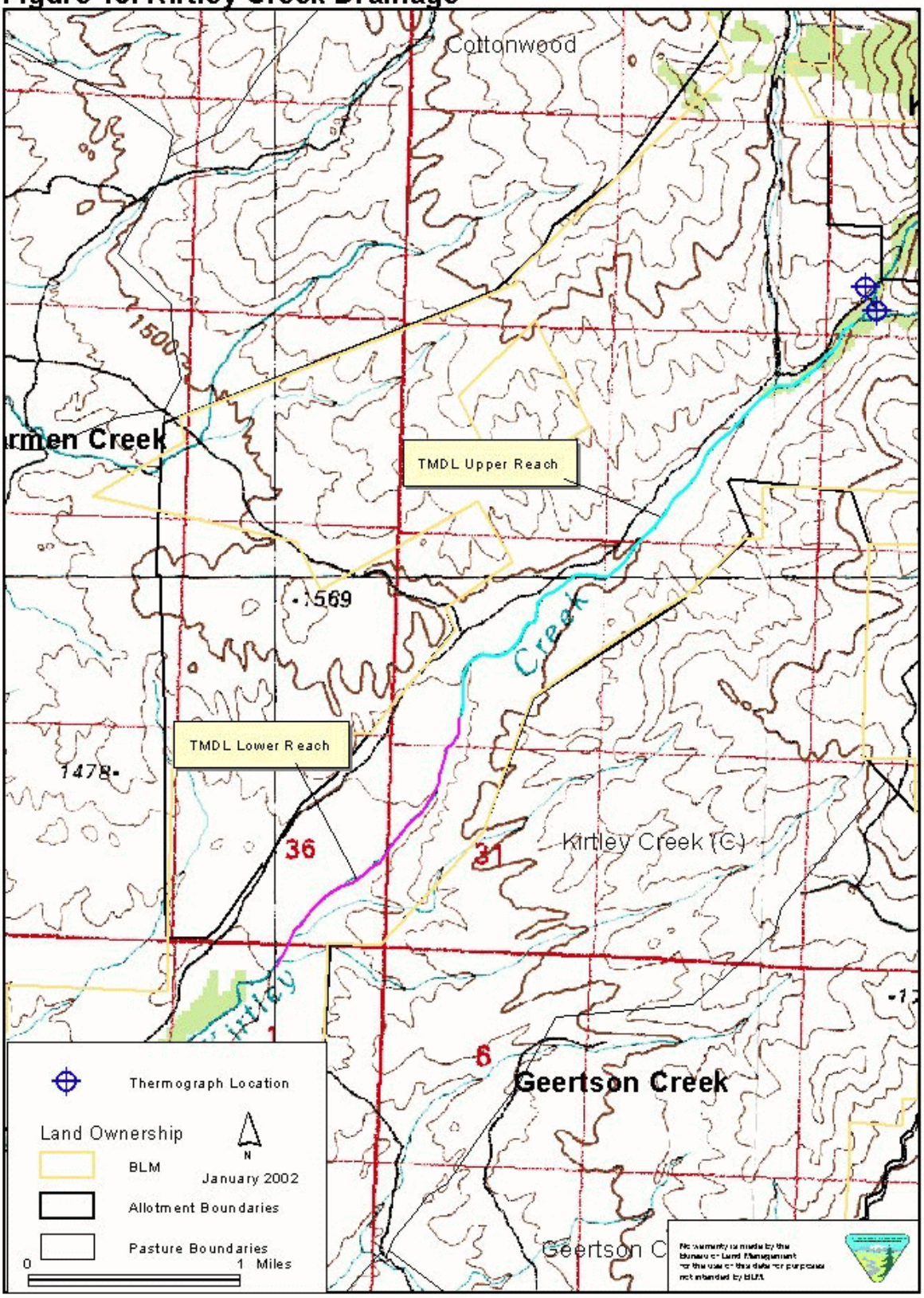


Figure 19. North Fork Kirtley Creek Thermograph Monitoring Site

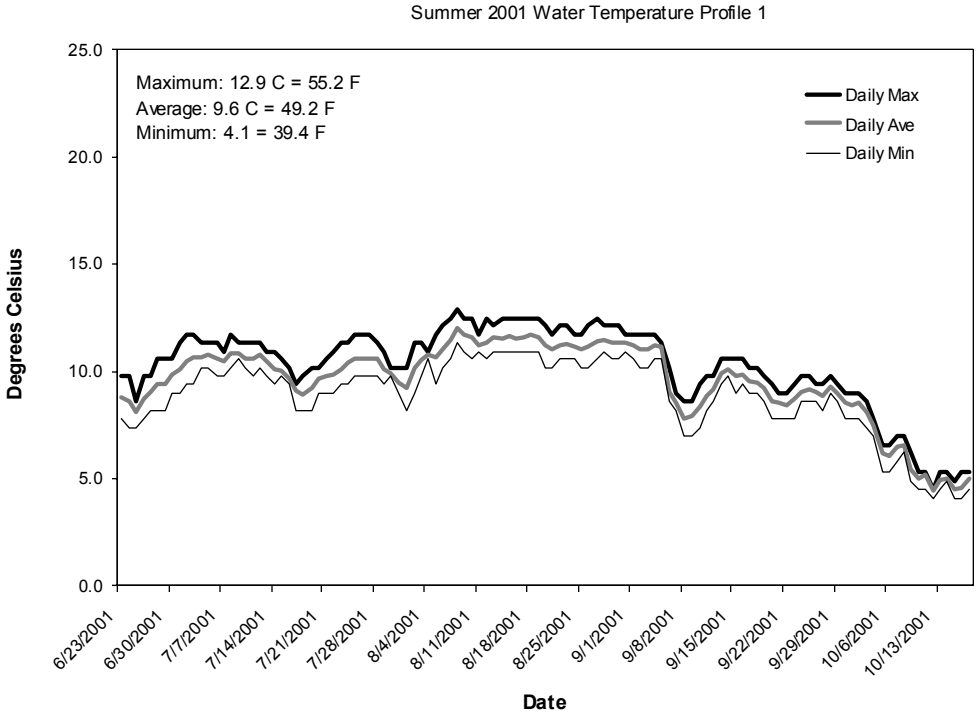


Figure 20. North Fork Kirtley Creek Thermograph Monitoring Site

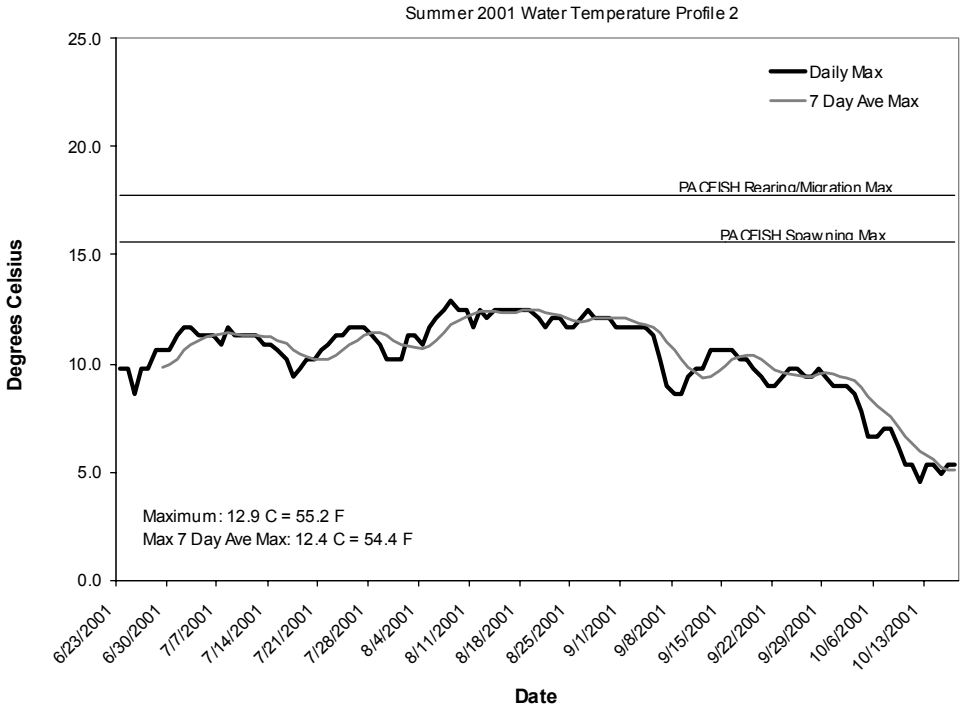


Figure 21. East Fork Kirtley Creek. July 27, 2000.

Completed Project Implementation

In 2000, approximately 1/4 mile of the Kirtley Creek Road was surfaced and a culvert installed in order to reduce sediment production and improve water balance. In addition, a ½ mile fence was built to exclude the East Fork of Kirtley Creek.

In 2001, the Upper Kirtley/Freeman Creek Road was bladed to improve drainage, reduce erosion, and address the potential for sediment production identified in the TMDL. In addition to road maintenance, an electric fence was put in place across private and BLM land at the lower end of Boomer Canyon. The purpose of this fence is to keep cattle on the lower part of private land until later in the season, allowing herbaceous vegetation to reach seed ripe and further stabilize upland conditions.

2002 Implementation Plan

Remaining Data Needs

Water temperature data collection will continue on Kirtley Creek. The BLM will consider modeling sediment production potential from the East Fork Kirtley Creek Road.

Remaining Project Implementation

The drift fence across the lower end of the East Fork of Kirtley Creek needs to be extended to block access to new livestock trails. The electric fence across Boomer Canyon will continue to be used seasonally. The fence will be extended in 2002. Road improvements will continue in the Kirtley Creek drainage to bring all main routes up to Best Management Practices and reduce sediment production. Weed control will continue as needed.

McDevitt Creek

Water Quality Concerns

IDEQ data shows subsurface fine sediments at 44.5% which are above desired levels of <20% on McDevitt Creek. Multiple age classes of fish were not documented by IDEQ. This stream has the most lineal distance on BLM identified as requiring improvement, approximately 6.5 miles.

Figure 22. Key area on the McDevitt Creek Middle Reach. October 3, 2001.

Data Gathering Results

Streambank Stability

In 2001, the BLM surveyed bank stability on BLM lands within three reaches identified as needing improvements in the TMDL. Results are listed in Table 7 and shown in Figure 23.

Table 7. McDevitt Creek bank erosion required reductions on BLM and bank stability survey results.

Site	Required Reduction in Erosion Rates	BLM Surveyed Percentage Stable Bank
Dipping Vat Gully Road	100% of potential	see photo points
Upper Reach	13%	76%
Middle Reach	94%	89%
Lower Reach	54%	93%

The TMDL called for a 13% reduction in bank erosion rates in the Upper McDevitt Reach (Figure23). The BLM's survey found 76% stable banks in this reach, indicating banks are slightly less stable than the estimated 80% stability in natural conditions. This reach is located in a narrow, steep sided canyon constraining the stream channel. This topography forces the road

into close proximity with the stream. Riparian vegetation along this reach includes mature alder, aspen, willow, and douglas fir. Steep talus slopes border some areas of the bank. Unstable banks in this reach are mostly the result of livestock grazing, but road grading practices also increase instability.

The TMDL called for a 94% reduction in bank erosion rates in the Middle McDevitt Reach (Figure 23). The BLM's survey found 89% stable banks; therefore, BLM lands along this reach are at naturally stable conditions. This reach has heavy historic grazing impacts, but riparian vegetation in on an upward trend due to changes grazing management since 1995. Areas previously covered with upland vegetation now have riparian vegetation along the streambanks, and in many places thick woody vegetation makes the streambank inaccessible. Pool habitat and woody debris are plentiful in this reach.

The TMDL called for a 54% reduction in bank erosion rates in the Lower McDevitt Reach (Figure 23). The BLM's survey found 93% stable banks; therefore, BLM lands along this reach are at naturally stable conditions. Similar to the Upper Reach, sections of unstable banks contributing sediment to the stream channel are due to road grading practices. Overall, this reach is characterized by a thick cover of woody vegetation making most sections of the banks inaccessible, and impacts from livestock grazing are minimal. Pool habitat and woody debris are also plentiful.

The TMDL called for a 100% reduction in sediment potential from Dipping Vat Gully (Figure 23). Dipping Vat Gully is naturally susceptible to erosion due to its soil type (Figure 27). Due to this factor, the BLM considers a 100% reduction in erosion potential from Dipping Vat Gully, as required in the TMDL, ineffective at improving water quality in the McDevitt Creek watershed. A streambank stability survey was determined to be an inappropriate method to assess the condition of the Dipping Vat drainage due to its intermittent nature. Instead, a photo point series was taken for long term monitoring. A sample of these photos follows (Figures 24 - 27). The location of all photo points are shown in Figure 28 and described in Table 8.

Figure 23. McDevitt Creek Drainage

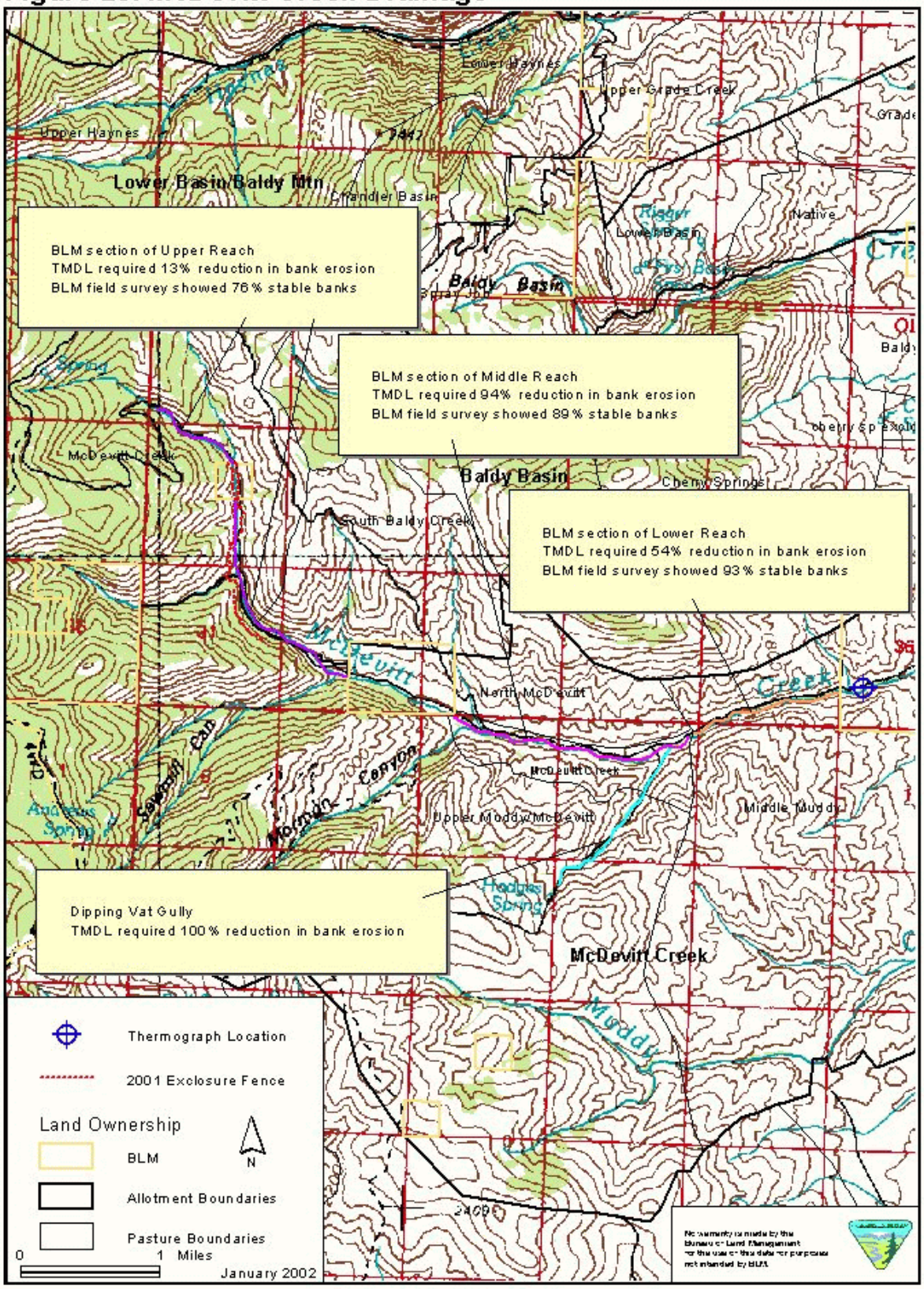


Figure 24. Dipping Vat photo point 3. View of headcut looking upstream. May 18, 2001.

Figure 25. Dipping Vat photo point 12. View of gully with aspen growing in bottom. May 18, 2001.

Figure 26. Dipping Vat photo point 10. View upstream showing proximity of road to stream channel. May 18, 2001.

Figure 27. Dipping Vat photo point 13. Example of naturally erosive soils. May 18, 2001.

Figure 28. Dipping Vat Photo Points

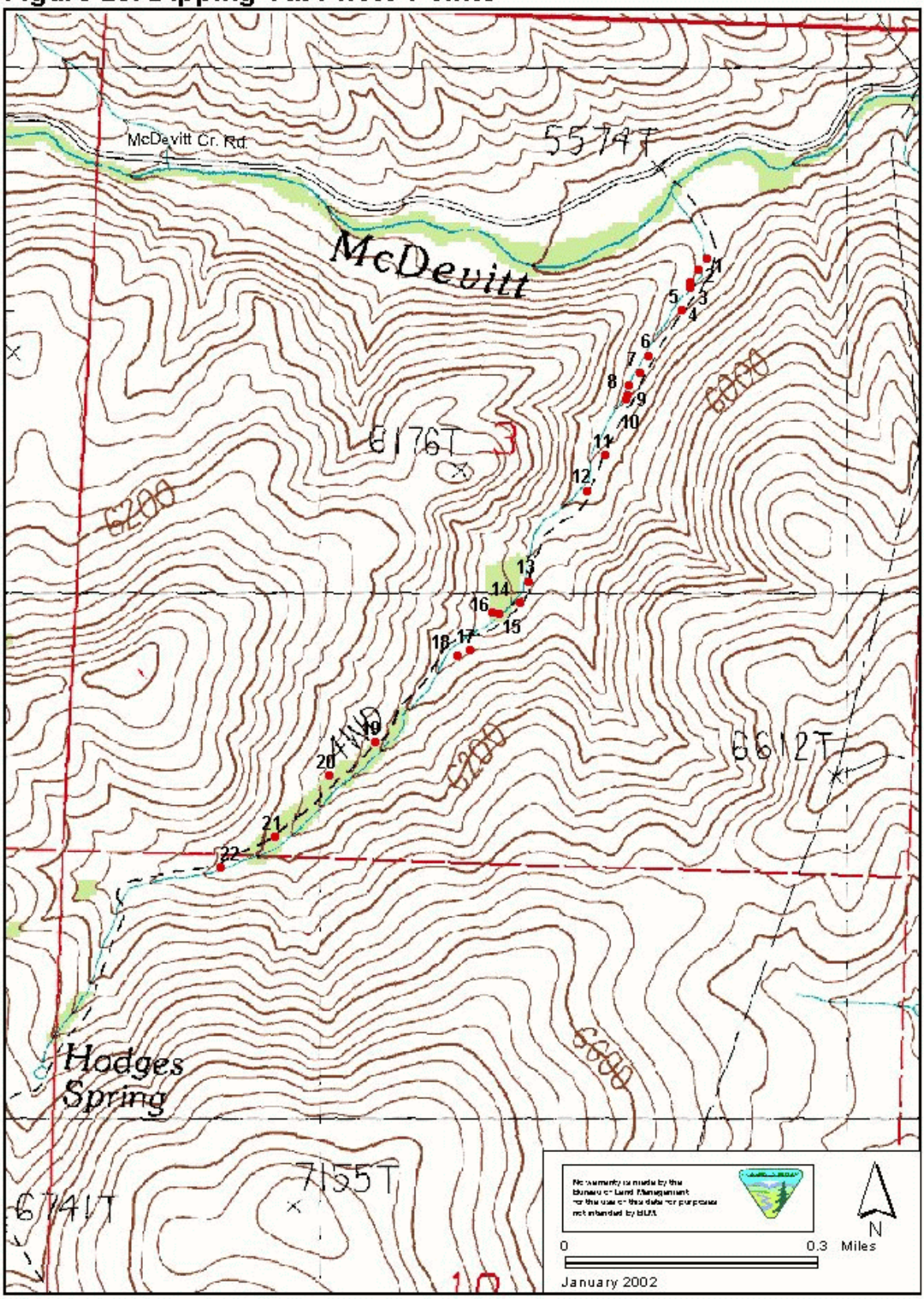


Table 8. Dipping Vat Gully photo point descriptions.

Photo Point #	Notes
1	Upstream view; where water begins to show and showing gully itself
2	Facing downstream; bank sloughing
3	Facing upstream; headcut
4	Facing downstream; stream channel above headcut
5	Facing upstream; close proximity of heavily vegetated steam channel to road
6	Facing downstream; vegetated stream channel
7	Facing downstream; alluvial deposits in eroding upper slopes
8	Locator photo looking down from new fence crossing
9	Facing upstream from fence crossing
10	Facing upstream; relationship of the road to the gully
11	Facing upstream; locator photo
12	Facing upstream; deep gully with aspen growing in bottom
13	Facing downstream; naturally erosive soils
14	Facing upstream; proximity of road to one of several gullies
15	Facing upstream; headcut at upper end of gully
16	Facing upstream; dry channel
17	Stream crossing road
18:1	Facing downstream; large aspen stand
18:2	Facing upstream from same point as 18:1
19	Facing downstream from road; stream in aspen complex
20	Facing downstream; thick riparian vegetation
21:1	Facing upstream; stream forced out of original channel
21:2	Facing upstream; historical stream channel
22:1	Facing upstream; showing heavy load of fines
22:2	Facing upstream; upper end of drainage

Water Temperature Monitoring

The BLM has monitored water temperature with thermographs on McDevitt Creek since 1994 as part of an ongoing effort to monitor riparian health on BLM managed lands. In 2001, water temperature data were collected at the lower McDevitt monitoring site in section 36. The thermograph was in place from late June until the middle of October and was set to record ten temperature readings per day. Water temperature profiles for McDevitt Creek are shown in Figures 29 and 30. As shown in Figure 30, water temperatures stayed below PACFISH standards during the 2001 season.

Figure 29. McDevitt Creek Lower Thermograph Monitoring Site

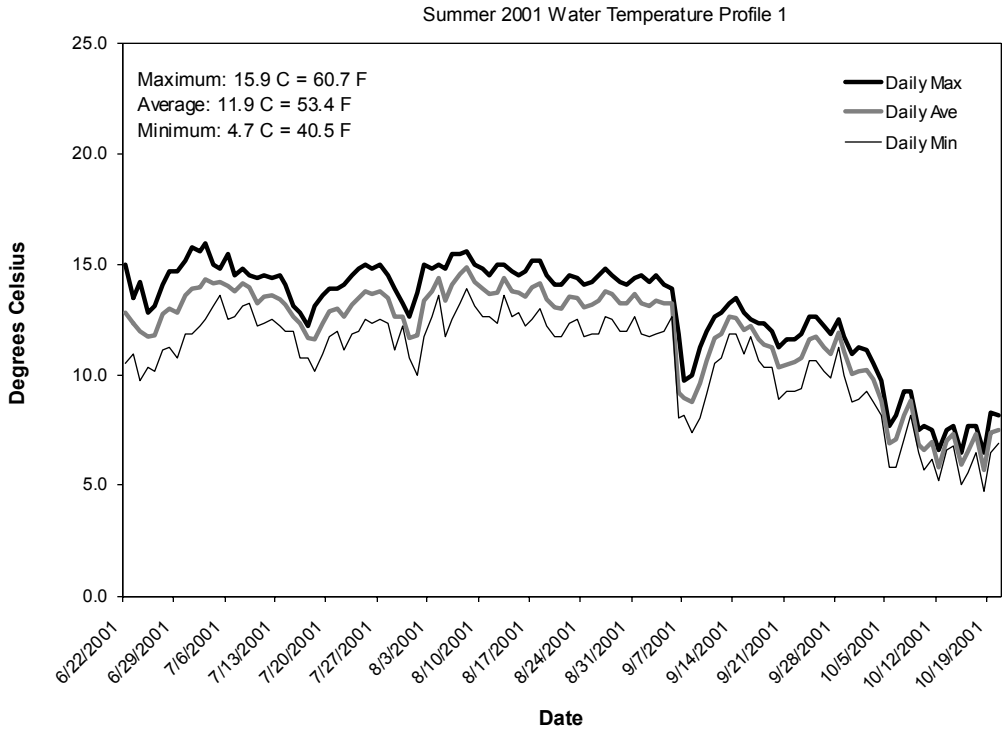
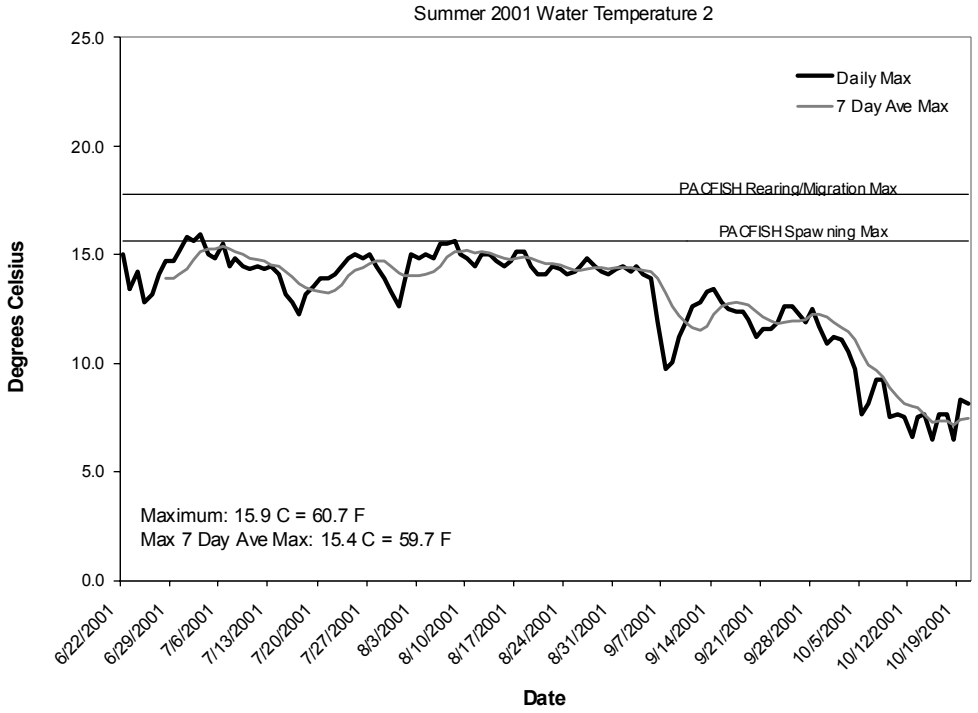


Figure 30. McDevitt Creek Lower Thermograph Monitoring Site



Completed Project Implementation

In 2000, two culverts were installed on Dipping Vat Road to reduce sediment to McDevitt Creek. In Burton Gulch, a culvert was installed and approximately ½ mile of road was reconstructed to reduce weed invasion vectors and decrease sediment production into McDevitt Creek. The upper McDevitt cattleguard was cleaned to provide for proper drainage and reduce road gullying and sedimentation. Light grazing use on main McDevitt Creek was continued on the McDevitt Creek Allotment riparian pasture. Finally, an electric fence was constructed to exclose parts of main McDevitt Creek in the Baldy Basin Allotment to further protect the stream and enhance woody species regeneration.

In 2001, the BLM built a permanent fence excluding McDevitt Creek in the Baldy Basin Allotment from grazing on BLM land between the two private parcels on the Upper Reach. This reach had the lowest bank stability rating on McDevitt Creek with 76% stable banks (Figure 23). A total of 260 acres of riparian habitat was excluded. The primary goal of this work was to implement the TMDL by protecting streambanks from grazing impacts, and therefore reduce sediment production and improve stability ratings. A number of road maintenance projects were also completed in 2001. Drainage was improved on Dipping Vat Road with the addition of two

culverts and seven waterbars with the goal of directing water off the road. Two cattleguards were installed in the newly excluded riparian section along the Upper Reach. The Burton Gulch Road was bladed and the culvert installed in 2000 was cleaned.

2002 Implementation Plan

Remaining Data Needs

Water temperature data collection will continue on McDevitt Creek. McNeal core samples will be taken following Salmon Challis National Forest protocols at the BURP site on McDevitt Creek. In addition, data is needed on the presence/absence of multiple age classes of fish.

Remaining Project Needs

Additional road maintenance is needed in the McDevitt drainage, and road improvements will continue in order to bring all main routes up to Best Management Practices and reduce sediment production. Due to the close proximity of the Haynes/McDevitt loop road along the McDevitt Creek bottom, the road continues to contribute sediment into McDevitt Creek. To reduce this impact, concrete barriers will be placed as needed along the Lower Reach in sections 35 and 2 in order to stop sediment from the road reaching the stream. In addition, the section of the McDevitt Creek Road going through the Upper Reach needs road work including: pulling an earthen berm back into the road bed, reconstructing the road prism, improving drainage, and cleaning ditches. These improvements will positively impact areas identified in this report where road conditions are contributing to unstable banks on McDevitt Creek. In addition, the area around Dipping Vat Gully will be scoped for grazing alternatives to provide for riparian improvement, and two sections on the Haynes/McDevitt loop road will have culverts replaced and drainage structures improved. Weed control will continue as needed.

Wimpey Creek

Water Quality Concerns

The primary sediment source in Wimpey Creek has been identified as being on private land; however, a corner of BLM crosses this reach. Multiple age classes of fish were not documented on BLM lands by IDEQ.

Data Gathering Results

Fish Surveys

In summer 2000, IDFG electroshocked several sites on Wimpey Creek. Eleven Westslope cutthroat trout of multiple age classes, including YOY, were captured in one reach sampled in the East Fork on BLM. No fish were found in the West Fork. Both Wimpey Creek and the West Fork dewater seasonally directly above their confluence. This is a natural phenomena not caused by irrigation diversions and serves, in combination with natural barriers, to block fish migration beyond this point in both channels.

Streambank Stability

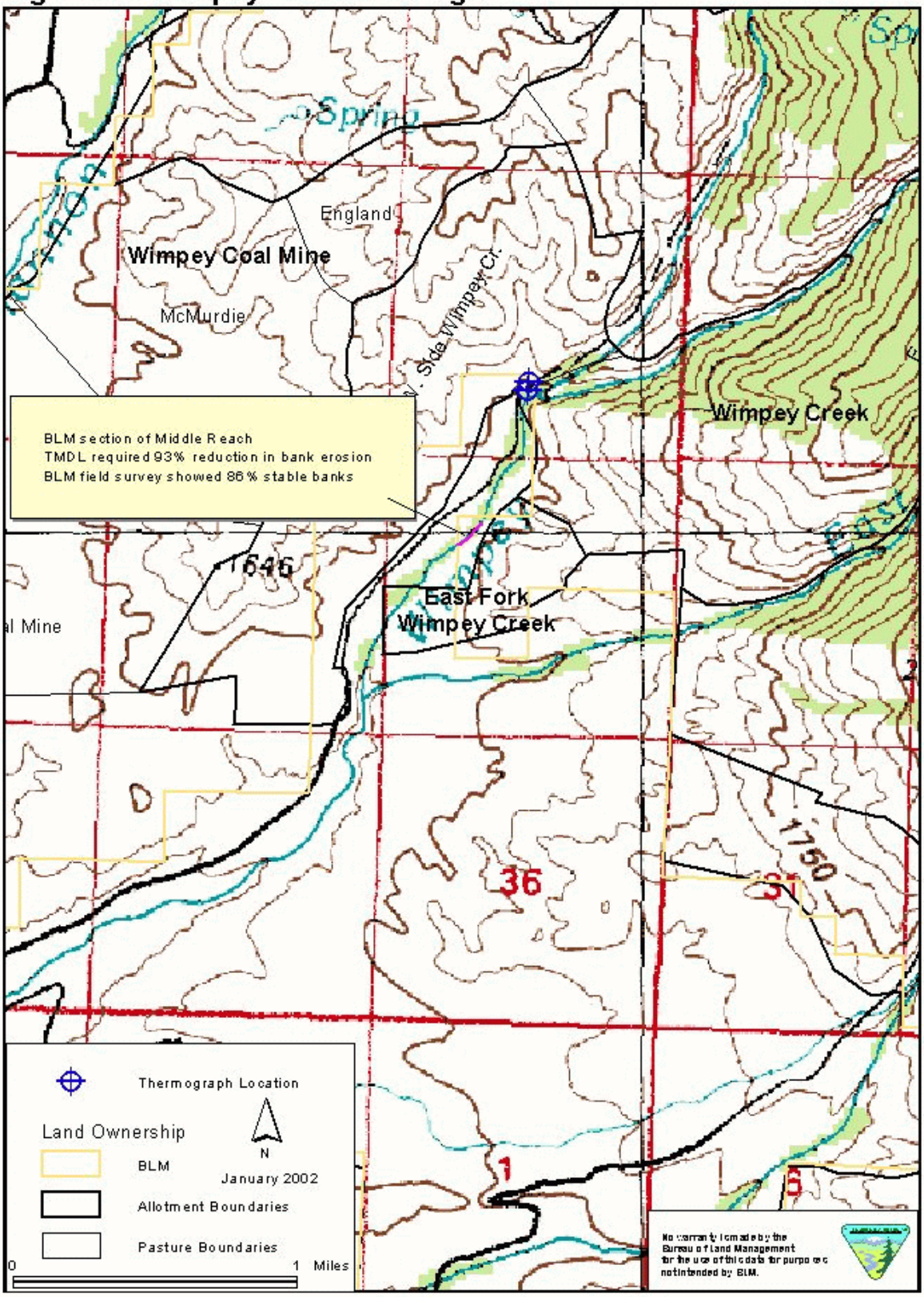
In 2001, the BLM surveyed bank stability on the corner of BLM land included in the TMDL Middle Reach. Results are listed in Table 8 and shown in Figure 31.

Table 9. Wimpey Creek bank erosion required reductions on BLM and bank stability survey results.

Site	Required Reduction in Erosion Rates	BLM Surveyed Percentage Stable Bank
Middle Reach	93%	86%

The TMDL called for a 93% reduction in bank erosion rates in the Middle Reach (Figure 31). The BLM's survey found 86% stable banks; therefore, BLM lands along this reach are at naturally stable conditions. Overall, riparian habitat along this reach is in excellent condition. It is a Rosgen "B" channel type with abundant woody debris and pool habitat. This section of BLM is fenced in with private land, but impacts from cattle are minimal.

Figure 31. Wimpey Creek Drainage



Completed Project Implementation

In 2000, the Wimpey Coal Mine Allotment was rested from livestock grazing and a prescribed burn was prepared in the upper portions of the watershed to reduce fuel loading and improve the water balance to Wimpey Creek.

In 2001, the BLM dug waterbars and drainage ditches on two spur roads off the West Fork Wimpey Road to improve drainage. Approximately three miles of road were maintained. In addition, in a section where the stream was diverted into the road for 1/4 mile by downed trees, the trees were removed and the stream was redirected back into its original channel.

Figure 32. Youth Employment Program participants digging trenches to improve drainage. August 10, 2001.

2001 Implementation Plan

Remaining Data Needs

Water temperature data collection will continue on Wimpey Creek. All other data collection efforts in this watershed are complete.

Remaining Project Implementation

The prescribed burn prepared in 2000 was not burned in 2001 due to lack of proper burning conditions. Given proper conditions, this area will be burned in the spring of 2002. Road improvements will continue to bring all main routes up to Best Management Practices and reduce sediment production. Weed control will continue as needed.

Summary of Salmon Field Office TMDL 2002 Work Load

Bohannon Creek
- Consider modeling sediment production potential from roads
- Continue water temperature monitoring
- Take McNeal Core sample at BURP site
- Build an exclosure fence on the mainstem at the BLM/private boundary
- Evaluate ways to improve bank stability on the TMDL Lower Reach
- Continue road maintenance

Eighteenmile Creek
- Continue water temperature monitoring
- Take McNeal Core sample at BURP site
- Continue road maintenance
- Implement RMP amendment in the WSA

Geertson Creek
- Determine if fish spawn near the lake outlet
- Conduct a PFC on Gary Creek
- Evaluate bank stability on Gary Creek
- Consider modeling sediment production potential from roads
- Build exclosure fence at the mouth of the Geertson Creek canyon
- Extend the Gary Creek pipeline
- Continue road maintenance

McDevitt Creek
- Perform presence/absence study for multiple age classes of fish
- Take McNeal Core sample at BURP site
- Continue water temperature monitoring
- Place barriers along sections of road in the Lower Reach (sections 35,2)
- Improve drainage off road through Upper Reach, pull earthen berm back
- Increase culvert size in two locations on Haynes/McDevitt Rd and improve drainage
- Scope grazing alternatives around Dipping Vat Gully
- Continue road maintenance

Kirtley
- Consider modeling sediment production potential from roads
- Continue water temperature monitoring
- Extend drift fence to block livestock from accessing the East Fork
- Extend the electric fence across Boomer Canyon
- Continue road maintenance

Wimpey Creek

- Continue water temperature monitoring
- Prescribed burn in spring
- Continue road maintenance as needed

Little Eightmile Creek
- Continue water temperature monitoring on USFS

Sandy Creek
- Begin water temperature monitoring on USFS

Short Creek
- Evaluate bank stability on USFS